

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A mixer device having an input terminal and an output terminal, comprising:

an amplifier circuit including:

a first amplifier whose input-to-output characteristic indicates a hyperbolic tangent function characteristic;

a second amplifier whose input-to-output characteristics indicates an exponential characteristic, the second amplifier being connected in parallel to the first amplifier; and

an input node and an output terminals node which are common to the first amplifier and the second amplifier; and

a bias controller ~~configured~~ to control a bias of at least one of the first amplifier and the second amplifiers amplifier; and

a variable gain an additional differential amplifier connected between the output terminal and [[a]] the output node [[of]] common to the first amplifier and the second amplifier and the output terminal; and

a gain controller to supply a gain control signal to the variable gain amplifier.

Claim 2 (Currently Amended): A mixer device having an input terminal and an output terminal, comprising:

an amplifier circuit including:

a differential amplifier whose input-to-output characteristic indicates a hyperbolic tangent function characteristic and which is configured by a differential pair of transistors connected to a variable current source;

a common emitter amplifier whose input-to-output characteristic indicates an exponential characteristic and which is connected in parallel to the differential amplifier and is configured by a pair of common-emitter configuration transistors;

an input node and an output terminals node which are common to the differential amplifier and the common emitter amplifier, an input signal being input to the input ~~terminals~~ node and an output signal output from the output ~~terminals~~ node;

and

a bias control configured to control a bias of at least one of the differential amplifier and the common emitter amplifier; ~~and~~

a variable gain ~~an additional differential~~ amplifier connected between the output terminal and ~~[[a]] the output node~~ ~~[[of]] common to the differential amplifier and the common emitter amplifier and the output terminal; and~~

a gain controller to supply a gain control signal to the variable gain amplifier.

Claim 3 (Currently Amended): A mixer device having an input terminal and an output terminal, comprising:

an amplifier circuit including:

a differential amplifier whose input-to-output characteristic indicates a hyperbolic tangent function characteristic and which is configured by a differential pair of transistors whose emitters are connected to a variable current source;

a common emitter amplifier whose input-to-output characteristic indicates an exponential characteristic and which is connected in parallel to the differential amplifier and is configured by a pair of common-emitter configuration transistors whose emitters are grounded through a variable voltage source;

an input node and an output terminals node which are common to the differential amplifier and the common emitter amplifier, an input signal being input to the input terminal node and an output signal from the output terminals node; and

a bias controller configured to control a bias of at least one of the differential amplifier and the common emitter amplifier; ~~and~~

a variable gain ~~an additional differential~~ amplifier connected between the output terminal and ~~[[a]] the output~~ node of the differential amplifier and the common emitter amplifier ~~and the output terminal, and~~

a gain controller to supply a gain control signal to the variable gain amplifier.